

## Appendix A: Questionnaire for Participant Survey

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Hello may I speak with [participant name]? My name is \_\_\_\_\_ and I am calling on behalf of the Midwestern Energy Efficiency Alliance and the Illinois Department of Commerce and Economic Opportunity (DCEO).

According to our records you completed a building operator certificate [Level and date] and received a tuition rebate.

Is that correct?

- ☐ Yes
- ☐ No (Thank and terminate)
- ☐ Don't know (Thank and terminate)

I would like to speak with you about your experience with that course. The survey should take about 20 minutes. Is this a good time to talk?

[If no, reschedule]

[If refused, skip to end of survey and hit submit]

1. What are the sources your organization relies on for information about energy efficient practices, equipment, materials and design features? *(Do not read list. Select all that apply.)*
  - ☐ DCEO representatives
  - ☐ The DCEO website
  - ☐ Utility representatives
  - ☐ The Midwestern Energy Efficiency Alliance (MEEA)
  - ☐ Brochures or advertisements
  - ☐ Trade associations or business groups you belong to
  - ☐ Trade journals or magazines
  - ☐ Friends and colleagues
  - ☐ The Smart Energy Design Assistance Center (SEDAC)
  - ☐ The Energy Resource Center (ERC)
  - ☐ Architects, engineers or energy consultants
  - ☐ Equipment vendors or building contractors
  - ☐ Other (please describe)
  - ☐ Don't know
2. How did you learn about the DCEO tuition rebate for the BOC training? *(Do not read list. Select all that apply.)*
  - ☐ From a BOC program representative
  - ☐ A Midwestern Energy Efficiency Alliance (MEEA) representative
  - ☐ A DCEO representative mentioned it
  - ☐ The DCEO website
  - ☐ From a utility representative
  - ☐ Brochures or advertisements

- ☐ Trade association or business group you belong to
  - ☐ Trade journal or magazine
  - ☐ Friend or colleague
  - ☐ From a representative of Smart Energy Design Assistance Center (SEDAC)
  - ☐ From a representative of the Energy Resource Center (ERC)
  - ☐ An architect, engineer or energy consultant
  - ☐ Equipment vendor or building contractor
  - ☐ Attended a conference workshop or seminar
  - ☐ Past experience with the program
  - ☐ An energy service company
  - ☐ Other (please describe)
  - ☐ Don't know
3. When you learned about the tuition rebate available for the BOC courses, did you already know about the BOC training?
- ☐ Yes
  - ☐ No
  - ☐ Don't know
4. Which of the following policies or procedures does your organization have in place regarding energy efficiency improvements at this facility? *(Select all that apply)*
- ☐ An energy management plan (If selected, go to 4A)
  - ☐ A staff member responsible for energy and energy efficiency
  - ☐ Policies that incorporate energy efficiency in operations and procurement
  - ☐ Active training of staff
  - ☐ Other (please specify)
  - ☐ Don't know
- 4A. Does your energy management plan include goals for energy savings?
- ☐ Yes (If selected, go to 4B)
  - ☐ No
  - ☐ Don't know
- 4B. Could you describe the goals specified in your energy management plan?
5. What motivated you to participate in the BOC course? *(Do not read list. Select all that apply.) (Use as prompts if necessary)*
- ☐ Career opportunity
  - ☐ Learn new skills
  - ☐ Personal interest
  - ☐ Learn about energy efficiency
  - ☐ Other
  - ☐ Don't know
6. How important was the tuition rebate in your decision to participate? *(Read list)*
- ☐ Very important

- ☐ Somewhat important
  - ☐ Only slightly important
  - ☐ Not important at all
  - ☐ Don't know
7. Would you have been financially able to attend the BOC training if the tuition rebate had not been available?
- ☐ Yes
  - ☐ No
  - ☐ Don't know
8. If the tuition rebate had not been available, how likely would you have been to participate in the BOC course anyway? *(Read list)*
- ☐ Definitely would have participated
  - ☐ Probably would have participated
  - ☐ Probably would not have participated
  - ☐ Definitely would not have participated
  - ☐ Don't know
9. Were any of the courses you took through the BOC program particularly useful?
- ☐ Yes (If marked, go to 9A)
  - ☐ No
  - ☐ Don't know
- 9A. Which ones and what made them useful?
10. Were there any courses that you found to not be very useful?
- ☐ Yes (If marked, go to 10A)
  - ☐ No
  - ☐ Don't know
- 10A. Which ones and what made them not very useful?
11. Why did you attend the BOC training? *(Do not read list. Select all that apply.) (Use as prompts if necessary)*
- ☐ Required by company/organization
  - ☐ To learn new job skills
  - ☐ To advance in my current job
  - ☐ To improve my chances of getting a new job
  - ☐ To earn continuing education credits
  - ☐ To learn about energy efficiency
  - ☐ Because of the tuition rebate
  - ☐ Other
  - ☐ Don't know
12. Have you encountered any barriers to applying what you learned about energy efficiency improvements during the BOC training?

- ☐ Yes (If selected, go to 12A)
  - ☐ No
  - ☐ Don't know
- 12a. What barriers have you encountered? *(Do not read list, but use as possible prompts)*
- ☐ Lack of supervisor support
  - ☐ Insufficient budget
  - ☐ Organization/company not committed to energy efficiency improvements
  - ☐ Not enough staff resources to plan efficiency projects
  - ☐ Other
  - ☐ Don't know
13. What is the approximate square footage of your building or buildings?
14. What percentage of that space are you responsible for?
15. How many hours per week is your site open for business?
16. What type of facility is it? *(Do not read list)*
- ☐ College/University
  - ☐ Elementary
  - ☐ Grocery
  - ☐ Healthcare Clinic
  - ☐ Heavy Industry
  - ☐ High School/Middle School
  - ☐ Hospital
  - ☐ Hotel/Motel
  - ☐ Light Industry
  - ☐ Lodging Hotel/Motel
  - ☐ Manufacturing Facility
  - ☐ Medical
  - ☐ Office - High Rise
  - ☐ Office - Low Rise
  - ☐ Office - Mid Rise
  - ☐ Religious Facility
  - ☐ Restaurant
  - ☐ Retail - Department Store
  - ☐ Retail - Strip Mall
  - ☐ Retail/Service
  - ☐ School (K-12)
  - ☐ Warehouse
  - ☐ Other
  - ☐ Don't know

17. Since participating in the BOC program have you implemented any of the following types of energy efficiency projects? *(Ask follow up energy impact assessment questions for any project types indicated)*
- ☐ Lighting Controls
  - ☐ Energy efficient lighting
  - ☐ NEMA premium energy efficient motors
  - ☐ VSDs
  - ☐ Compressed air projects
  - ☐ Energy management systems
  - ☐ Heating system improvements
  - ☐ Air conditioning improvements
  - ☐ Economizer on an air handler
  - ☐ Water heating efficiency improvements
  - ☐ Other improvements
  - ☐ None
  - ☐ Don't know
18. Is there somebody we can contact about the measures that may have been installed after attending the BOC course? Please provide a name, phone number, and email address.
19. At how many facilities did you implement any of the previously listed projects?
- ☐ 1
  - ☐ 2
  - ☐ 3
  - ☐ 4
  - ☐ 5
  - ☐ 6
  - ☐ 7
  - ☐ 8
  - ☐ 9
  - ☐ 10 or more
  - ☐ Don't know
20. Is there somebody we can contact about the measures that may have been installed after attending the BOC course? Please provide a name, phone number, and email address.

## Energy Impact Follow Up Questions

### Lighting Controls

- LC1. Now I would like to ask you some questions about the lighting controls you implemented. How likely is it that you would have made these improvements had you had not attended the course? *(Read list)*
- ☐ Definitely would have made the improvements
  - ☐ Probably would have made the improvements
  - ☐ Probably would not have made the improvements

- ☐ Definitely would not have made the improvements  
☐ Don't know

LC2. Had you implemented a similar project prior to attending the BOC training?

- ☐ Yes  
☐ No  
☐ Don't know

LC3. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?

- ☐ Yes  
☐ No  
☐ Don't know

LC4. What type of new lighting controls did you implement?

- ☐ Occupancy sensors (if selected, go to LC4A, LC4B, LC4C)  
☐ Day lighting controls (if selected, go to LC4D, LC4E, LC4F)  
☐ Don't know

LC4A. How many fixtures are controlled by the occupancy sensors, what type of fixture are they, and what is the wattage of those fixtures?

	Type of fixture	Number of fixtures	Wattage of fixtures
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

LC4B. How many hours per day did the lights controlled by the occupancy sensors operate before the controls were installed?

LC4C. Did the hours of operation for the lights change on weekends or holidays? If so, what were the operational hours during weekends or holidays?

LC4D. How many fixtures are controlled by the daylighting sensors, what type of fixture are they, and what is the wattage of those fixtures?

	Type of fixture	Number of fixtures	Wattage of fixtures
1			
2			
3			

4			
5			
6			
7			
8			
9			
10			

LC4E. How many hours per day did the lights controlled by the daylighting controls operate before the controls were installed?

LC4F. Did the hours of operation for the lights change on weekends or holidays? If so, what were the operational hours during weekends or holidays?

LC5 . What was the total estimated project cost for the lighting controls you installed? Please be as specific as possible.

### Energy efficient lighting

EEL1. Now I would like to ask you some questions about the energy efficient lighting you implemented. How likely is it that you would have made these improvements had you had not attended the course? *(Read list)*

- ☐ Definitely would have made the improvements
- ☐ Probably would have made the improvements
- ☐ Probably would not have made the improvements
- ☐ Definitely would not have made the improvements
- ☐ Don't know

EEL2. How many lighting projects did you complete?

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10 or more
- ☐ Don't know

EEL3. Had you implemented a similar project prior to attending the BOC training?

- ☐ Yes
- ☐ No
- ☐ Don't know

EEL4. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?

- ☐ Yes  
☐ No  
☐ Don't know

EEL5. For the fixtures that were replaced in the (number of project) project, please indicate the type of fixture, number of fixtures, and wattage of those fixtures. (Repeat question for each facility which lighting projects were completed.)

	Fixture Type	Fixture Count	Fixture Wattage
Old fixture			
New fixture			

EEL6. How many hours per day are the lights operational?

### Energy efficient motors

EEM1. Now I would like to ask you some questions about the energy efficient motors you implemented. How likely is it that you would have made these improvements had you had not attended the course? (*Read list*)

- ☐ Definitely would have made the improvements  
☐ Probably would have made the improvements  
☐ Probably would not have made the improvements  
☐ Definitely would not have made the improvements  
☐ Don't know

EEM2. Had you implemented a similar project prior to attending the BOC training?

- ☐ Yes  
☐ No  
☐ Don't know

EEM3. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?

- ☐ Yes  
☐ No  
☐ Don't know

EEM4. Were these motors installed for HVAC end-uses or for industrial end-uses? (*Select all that apply*)

- ☐ HVAC end-use (if selected, go to EEM4A,)   
☐ Industrial end-use (if selected, go to EEM4B)   
☐ Don't know

EEM4A. Thinking about one of the motors you installed, please provide the motor application (hot water pump, chilled water pump, supply fan, return fan, or cooling tower fan), efficiency of the motor, horsepower of the motor, and whether or not VSD's control the



motor. Additionally, please state how many motors you installed that have these same specifications. *(After respondent provides this information, ask whether they installed any additional motors with different specifications. Then, place the additional data in a separate motor group and repeat the data collection procedure until all motors or sets of motors have been described.)*

*(If the respondent is unable to provide the information on the project specifics, ask if the interview could be rescheduled at a time when the respondent could provide the information, or if there is someone else to speak to who was knowledgeable about the projects.)*

	Efficiency of Motors	Motor application	Horsepower of motors	VSD's ("y" for yes / "n" for no)	Number installed
(Motor Group 1)					
(Motor Group 2)					
(Motor Group 3)					
(Motor Group 4)					
(Motor Group 5)					

EEM4B. Thinking about one of the motors you installed for industrial purposes, please provide the motor application (hot water pump, chilled water pump, supply fan, return fan, or cooling tower fan), efficiency of the motor, horsepower of the motor, and whether or not VSD's control the motor. Additionally, please state how many motors you installed that have these same specifications. *(After respondent provides this information, ask whether they installed any additional motors with different specifications. Then, place the additional data in a separate motor group and repeat the data collection procedure until all motors or sets of motors have been described.)*

*(If the respondent is unable to provide the information on the project specifics, ask if the interview could be rescheduled at a time when the respondent could provide the information, or if there is someone else to speak to who was knowledgeable about the projects.)*

	Efficiency of Motors	Number installed	Motor application	Horsepower of motors	Hours per day of operation	VSD's ("y" for yes / "n" for no)
(Motor Group 1)						
(Motor Group 2)						
(Motor Group 3)						
(Motor Group 4)						
(Motor Group 5)						

EEM5. What was the total estimated project cost for the efficient motors you installed? Please be as specific as possible.

EEM6. Who can we contact about the technical specifics of the energy efficient motors you installed? Please be as specific as possible.

### **VSDs**

VSD1. Now I would like to ask you some questions about the VSDs you implemented. How likely is it that you would have made these improvements had you had not attended the course? *(Read list)*

- ☐ Definitely would have made the improvements
- ☐ Probably would have made the improvements
- ☐ Probably would not have made the improvements
- ☐ Definitely would not have made the improvements
- ☐ Don't know

VSD2. Had you implemented a similar project prior to attending the BOC training?

- ☐ Yes
- ☐ No
- ☐ Don't know

VSD3. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?

- ☐ Yes
- ☐ No
- ☐ Don't know

VSD4. Were the VSDs installed on existing motors part of an HVAC system?

- ☐ Yes (if selected, go to VSD4A)
- ☐ No (if selected, go to VSD4B)
- ☐ Some were part of an HVAC system, some were not (if selected, go to VSD4A and VSD4B)
- ☐ Don't know

VSD4A. For each of the VSDs used in a HVAC system, please provide the number of VSDs installed and the horsepower of the motors controlled.

<b>Motor Application</b>	<b>Number of VSDs Installed</b>	<b>Horsepower of Motors Controlled by VSDs</b>
Hot Water Pump		
Chilled Water Pump		
Supply Fan: Constant Volume		
Supply Fan: Air Foil/inlet Guide Vanes		
Supply Fan: Forward Curved Fan, with discharge dampers		
Supply Fan: Forward Curved Inlet Guide Vanes		
Cooling Tower Fan		
Custom Process		

VSD4B. For the existing motors not used in a HVAC system, what is the total number of motors and total motor horsepower controlled by the VSDs?

Number of motors:	
Individual motor horsepower:	
Operation hours:	
Motor efficiency:	

VSD5. What was the total estimated project cost for the VSD's you installed? Please be as specific as possible.

VSD6. Who can we contact about the technical specifics of the VSD installation if needed? Please provide a name, phone number, and email address.

### Compressed air projects

CA1. Now I would like to ask you some questions about the compressed air projects you implemented. How likely is it that you would have made these improvements had you had not attended the course? *(Read list)*

- ☐ Definitely would have made the improvements
- ☐ Probably would have made the improvements
- ☐ Probably would not have made the improvements
- ☐ Definitely would not have made the improvements

CA2. Had you implemented a similar project prior to attending the BOC training?

- ☐ Yes
- ☐ No
- ☐ Don't know

CA3. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?

- ☐ Yes
- ☐ No
- ☐ Don't know

CA4. What is the horsepower of each air compressor in the system?

	Horsepower	VSD? (yes or no)
Compressor 1		
Compressor 2		
Compressor 3		
Compressor 4		
Compressor 5		

CA5. What kind of compressed air project did you implement? *(Do not read list.) (Select all that apply.) (For each response selected, follow up with CA6.)*

- ☐ New high efficiency single-speed compressor

- ☐ New high efficiency variable-speed compressor
- ☐ New efficient refrigerated air dryer
- ☐ New efficient desiccant air dryer
- ☐ Improved staging controls
- ☐ Other (Please specify type of compressed air equipment and quantity of units)
- ☐ Don't know

CA6. For the new high efficiency (type of air compressor) compressor, what is the total number of compressors and horsepower of each new compressor? (Repeated for each compressed air project selected in CA5.)

Number of new compressors:	
Horsepower for each new compressor:	

CA7. What type of other air compressor project did you implement? Please describe the equipment and quantity of units.

CA8. Who can we contact about the technical specifics of the compressed air project(s)? Please provide name, phone number, and email address.

### Energy management systems

EMS1. Now I would like to ask you some questions about the energy management system(s) you implemented. How likely is it that you would have made these improvements had you had not attended the course? *(Read list)*

- ☐ Definitely would have made the improvements
- ☐ Probably would have made the improvements
- ☐ Probably would not have made the improvements
- ☐ Definitely would not have made the improvements
- ☐ Don't know

EMS2. Had you implemented a similar project prior to attending the BOC training?

- ☐ Yes
- ☐ No
- ☐ Don't know

EMS3. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?

- ☐ Yes
- ☐ No
- ☐ Don't know

EMS4. What is the square footage of the area that the Energy Management System controls?

EMS5. Did you install a new energy management system after the BOC training?

- ☐ Yes
- ☐ No

☐ Don't know

EMS6. Did you make changes to an existing energy management system after the BOC training?

- ☐ Yes
- ☐ No
- ☐ Don't know

EMS7. Please describe the function of the Energy Management System? *(Do not read list. Select all that apply.)*

- ☐ On and off schedule
- ☐ Does everything
- ☐ Cooling plant optimization
- ☐ Cooling distribution optimization
- ☐ Outdoor air ventilization (economizer)
- ☐ Outdoor air ventilization (demand controlled ventilation with CO sensor)
- ☐ Air distribution optimization
- ☐ Heating plant and distribution optimization
- ☐ Other (Please specify all other)
- ☐ Don't know

EMS8. What was the total estimated project cost for the energy management system you installed? Please be as specific as possible.

EMS9. Who can we contact about the technical specifics of the energy management system project(s)? Please provide name, phone number, and email address.

### **Heating system improvements**

HS1. Now I would like to ask you some questions about the heating system improvements you implemented. How likely is it that you would have made these improvements had you had not attended the course? *(Read list)*

- ☐ Definitely would have made the improvements
- ☐ Probably would have made the improvements
- ☐ Probably would not have made the improvements
- ☐ Definitely would not have made the improvements
- ☐ Don't know

HS2. Had you implemented a similar project prior to attending the BOC training?

- ☐ Yes
- ☐ No
- ☐ Don't know

HS3. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?

- ☐ Yes
- ☐ No

☐ Don't know

HS4. What is the primary heating system type for the system you made improvements to? (Do not read list) (Select all that apply)

- ☐ Hot air furnace
- ☐ Wall or floorboard radiator (steam, hot water or electric resistance)
- ☐ Steam, hot water or electric resistance coils in ventilation system
- ☐ Space heaters
- ☐ Heat pump (air source)
- ☐ Heat pump (ground source)
- ☐ Heat pump (water loop)
- ☐ Electric boiler
- ☐ Gas boiler
- ☐ Other (Please specify)
- ☐ Don't know

HS5. What type of heating system improvements that produce energy savings did you implement? (Do not read list) (Select all that apply) *(For each response selected, follow up with HS8.)*

- ☐ Installed a heat recovery system
- ☐ Installed a furnace
- ☐ Installed a high efficiency boiler
- ☐ Installed a high efficiency low turn-down burner
- ☐ Installed oxygen trim control
- ☐ Other (Please describe the type and quantity of equipment installed)
- ☐ Don't know

HS6. What is the primary fuel source for heating? (Do not read list)

- ☐ Electric
- ☐ Gas
- ☐ Oil
- ☐ Purchased steam
- ☐ Other (Please specify)
- ☐ Don't know

HS7. What kind of heating system efficiency improvements did you make? Please include as many details about capacity, efficiency, and quantity as possible.

HS8. What is the capacity and efficiency of the (improvement type) installed? (Repeated for each project selected in HS5.)

Capacity (BTU):	
Efficiency level (AFUE):	

HS9. What was the total estimated project cost for the energy efficient heating system you installed? Please be as specific as possible.

HS10. Who can we contact about the technical specifics of the heating system project(s)? Please provide name, phone number, and email address.

### **Air conditioning improvements**

AC1. Now I would like to ask you some questions about the air conditioning improvements you implemented. How likely is it that you would have made these improvements had you had not attended the course? *(Read list)*

- ☐ Definitely would have made the improvements
- ☐ Probably would have made the improvements
- ☐ Probably would not have made the improvements
- ☐ Definitely would not have made the improvements
- ☐ Don't know

AC2. Had you implemented a similar project prior to attending the BOC training?

- ☐ Yes
- ☐ No
- ☐ Don't know

AC3. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?

- ☐ Yes
- ☐ No
- ☐ Don't know

AC4. What is the primary cooling system type for the system you made improvements to? (Do not read list) (Select all that apply)

- ☐ Chiller – air-cooled
- ☐ Chiller – water or evaporatively cooled
- ☐ Evaporative cooler
- ☐ Fans
- ☐ Direct expansion – air-cooled packaged or split system cooling or heat pump
- ☐ Geothermal heat pump
- ☐ Window or thermal units (PTAC/PTHP)
- ☐ Other (Please specify)
- ☐ Don't know

AC5. What type of air conditioning improvements that produced energy savings did you implement? *(Do not read list.) (Select all that apply)*

- ☐ Installed new high-efficiency chiller(s) (Go to AC7)
- ☐ Installed new terminal unit(s) (Go to AC8)
- ☐ Installed heat pump(s) (Go to AC9)
- ☐ Installed package unit(s) (Go to AC10)
- ☐ Installed split system(s) (Go to AC11)
- ☐ Other (Please describe the type and quantity of equipment installed)
- ☐ Don't know

AC6. What kind of air conditioning improvements did you make that were not listed above?

AC7. What is the capacity and efficiency level of the chiller(s) you installed?

	Capacity	Efficiency level
Improvement type 1		
Improvement type 2		
Improvement type 3		

AC8. What is the capacity and efficiency level of the terminal unit(s) you installed?

	Number of units	Capacity (tons)	Efficiency level (EER)	Efficiency level (SEER)
Unit(s)				

AC9. What type of heat pump did you install? (Do not read list) (Use as possible prompts)

- ☐ Air cooled heat pump
- ☐ Water source heat pump
- ☐ Ground source heat pump
- ☐ Water cooled heat pump
- ☐ Don't know

AC9A. What is the capacity and efficiency level of the chiller(s) you installed?

	Number of heat pumps	Efficiency level (EER or SEER or HSPF or COP)
Capacity of: Less than 1 1/2 tons		
Capacity of: 1 1/2 tons to 2 1/2 tons		
Capacity of: More than 2 1/2 tons to 5 tons		
Capacity of: More than 5 tons to 11 tons		
Capacity of: More than 11 tons to less than 20 tons		
Capacity of: More than 20 tons		

AC10. What is the capacity and efficiency level of the package unit(s) you installed?

	Number of units	Efficiency level (EER or SEER)
Capacity of: Less than 1 1/2 tons		
Capacity of: 1 1/2 tons to 2 1/2 tons		
Capacity of: More than 2 1/2 tons to 5 tons		
Capacity of: More than 5 tons to 11 tons		
Capacity of: More than 11 tons to less than 20 tons		
Capacity of: More than 20 tons		

AC11. What is the capacity and efficiency level of the split system you installed?



	Number of units	Efficiency level (EER or SEER)
Capacity of: Less than 1 1/2 tons		
Capacity of: 1 1/2 tons to 2 1/2 tons		
Capacity of: More than 2 1/2 tons to 5 tons		
Capacity of: More than 5 tons to 11 tons		
Capacity of: More than 11 tons to less than 20 tons		
Capacity of: More than 20 tons		

AC12. What was the total estimated project cost for the air conditioning improvements you installed? Please be as specific as possible.

AC13. Who can we contact about the technical specifics of the air-conditioning system project(s)? Please provide name, phone number, and email address

### **Economizers on Air Handlers**

E1. Now I would like to ask you some questions about the economizers on air handlers you implemented. How likely is it that you would have made these improvements had you had not attended the course? *(Read list)*

- ☐ Definitely would have made the improvements
- ☐ Probably would have made the improvements
- ☐ Probably would not have made the improvements
- ☐ Definitely would not have made the improvements
- ☐ Don't know

E2. Had you implemented a similar project prior to attending the BOC training?

- ☐ Yes
- ☐ No
- ☐ Don't know

E3. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?

- ☐ Yes
- ☐ No
- ☐ Don't know

E4. For the installed economizer, what is the capacity of the cooling system (in tons)?

E5. What is the total estimated project cost for the economizer you installed?

E6. Who can we contact about the technical specifics of the economizer project(s)? Please provide name, phone number, and email address

**Water heating efficiency improvements**

WH1. Now I would like to ask you some questions about the water heating improvements you implemented. How likely is it that you would have made these improvements had you had not attended the course? (*Read list*)

- ☐ Definitely would have made the improvements
- ☐ Probably would have made the improvements
- ☐ Probably would not have made the improvements
- ☐ Definitely would not have made the improvements
- ☐ Don't know

WH2. Had you implemented a similar project prior to attending the BOC training?

- ☐ Yes
- ☐ No
- ☐ Don't know

WH3. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?

- ☐ Yes
- ☐ No
- ☐ Don't know

WH4. What type of water heating improvements that produced energy savings did you implement? (*Do not read list. Select all that apply*)

- ☐ Installed timeclock to turn off circulation pump after hours (Go to WH5 and WH6)
- ☐ Installed heat recovery system (Go to WH8)
- ☐ Installed a more efficient hot water heater (Go to WH7)
- ☐ Insulated pipes(s) (How thick was the insulation and how many linear feet were installed?)
- ☐ Other (Go to WH8)
- ☐ Don't know

WH5. What kind of water heating system is controlled by the timeclock?

- ☐ Boiler
- ☐ Hot water heater
- ☐ Don't know

WH6. What is the capacity and efficiency level of the boiler that the timeclock is installed on?

	Capacity (BTU)	Efficiency level (AFUE %)
Boiler		

WH7. What is the capacity, number, and efficiency level of the more efficient hot water heater or boiler?

	Capacity	Type	New efficiency	Old efficiency	Quantity
Heater/Boiler					
Heater/Boiler					
Heater/Boiler					
Heater/Boiler					
Heater/Boiler					

WH8. Please describe the water heating improvements that produced energy savings including the type of equipment and quantity.

WH9. What was the total estimated project cost for the water heating improvements you installed? Please be as specific as possible.

### Other improvements

O1. You mentioned that you implemented some other energy efficiency projects. Can you describe what these projects were?

O2. Now I would like to ask you some questions about the other projects you implemented. How likely is it that you would have made these improvements had you had not attended the course? (*Read list*)

- ☐ Definitely would have made the improvements
- ☐ Probably would have made the improvements
- ☐ Probably would not have made the improvements
- ☐ Definitely would not have made the improvements
- ☐ Don't know

O3. Had you implemented a similar project(s) prior to attending the BOC training?

- ☐ Yes
- ☐ No
- ☐ Don't know

O4. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?

- ☐ Yes
- ☐ No
- ☐ Don't know

O5. Did these projects produce electricity, or natural gas savings or both?

- ☐ Electricity
- ☐ Natural gas
- ☐ Both
- ☐ Don't know

O6. What was the total estimated project cost for the other energy efficiency improvements you installed? Please be as specific as possible.

O7. Who can we contact about the technical specifics of these other project(s)? Please provide name, phone number, and email address

### Maintenance Energy Impacts Assessment

Now I'd like to ask you about changes in maintenance activities you may have implemented at your facility since completing the BOC training. For each of the following activities, please indicate if you have performed them differently or more frequently or both since participating in the BOC training.

	Differently	More Frequently	Both	No Chance	Don't Know
Maintenance on the cooling system equipment?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintenance on the heating equipment?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
motor maintenance, including belt alignment and tension?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintenance on compressed air system?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Electrical panel maintenance?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ventilation maintenance?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other energy savings maintenance?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[If maintenance is performed differently, more frequently, or both, for any category go to M1 and ask selected Maintenance Improvement Questions]

At how many facilities did you make these changes to your maintenance practices?

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10 or more
- ☐ Don't know

## Follow Questions for Maintenance Improvements

## Cooling system

CS1. You mentioned that you have changed how you perform maintenance on cooling system equipment since taking the BOC training. How likely would you have been to make these improvements to your maintenance practices if you had not attended the course? (Read list)

- ☐ Definitely would have made the improvements
- ☐ Probably would have made the improvements
- ☐ Probably would not have made the improvements
- ☐ Definitely would not have made the improvements
- ☐ Don't know

CS2. Please tell me which of the following changes you've made to your cooling system maintenance practices?

- ☐ Changes to cooling tower service (please include total tons)
- ☐ Changes to chiller bundle cleaning (please include chiller tons)
- ☐ Changes to condenser cleaning (please include cooling tons)
- ☐ Changes to refrigerant charge adjustment (please include system tons)
- ☐ Other changes
- ☐ Don't know

CS4. Who can we contact about the technical specifics of the cooling system maintenance practices if needed? Please provide a name, phone number, and email address.

## Heating equipment

HE1. You mentioned that you have changed how you perform maintenance on heating equipment since taking the BOC training. How likely would you have been to make these improvements to your maintenance practices if you had not attended the course? (Read list)

- ☐ Definitely would have made the improvements
- ☐ Probably would have made the improvements
- ☐ Probably would not have made the improvements
- ☐ Definitely would not have made the improvements
- ☐ Don't know

HE2. Please tell me which of the following changes you've made to your heating equipment maintenance practices. (select all that apply)

- ☐ Heat exchanger cleaning (Please provide capacity in BTU's)
- ☐ Blowdown frequency (Please provide boiler capacity in BTU's and number of traps)
- ☐ Steam trap (Please provide number of traps and whether they were cleaned, repaired, or replaced))
- ☐ Other
- ☐ Don't know

HE3. Please ask for additional information for each change indicated above, such as how frequently the maintenance was performed before and after the course.

HE4. Who can we contact about the technical specifics of the heating system maintenance practices if needed? Please provide a name, phone number, and email address.

### Air Compressor Maintenance

AC1. You mentioned that you have changed how you perform maintenance on air compressor equipment since taking the BOC training. How likely would you have been to make these improvements to your maintenance practices if you had not attended the course? (Read list)

- ☐ Definitely would have made the improvements
- ☐ Probably would have made the improvements
- ☐ Probably would not have made the improvements
- ☐ Definitely would not have made the improvements
- ☐ Don't know

AC2. Please tell me all the changes you have made to your air compressor equipment maintenance.

- ☐ Audible leak detection
- ☐ Ultra-sonic leak detection
- ☐ Pressure optimization
- ☐ End-use isolation
- ☐ Filter changes
- ☐ System diagnostics
- ☐ Other
- ☐ Don't know

AC3. Please ask for additional information for each change indicated above, such as how frequently the maintenance was performed before and after the course.

AC4. What is the total horsepower of the air compressor(s)?

AC5. What is the average CFM (Cubic Feet Per Minute) of the air compressor(s)?

AC6. Who can we contact about the technical specifics of the air compressor maintenance changes if needed? Please provide a name, phone number, and email address.

### Ventilation Maintenance

VM1. You mentioned that you have changed how you perform ventilation maintenance since taking the BOC training. How likely would you have been to make these improvements to your maintenance practices if you had not attended the course? (Read list)

- ☐ Definitely would have made the improvements
- ☐ Probably would have made the improvements
- ☐ Probably would not have made the improvements
- ☐ Definitely would not have made the improvements
- ☐ Don't know

VM2. Please tell me all the changes you have made to your ventilation maintenance. (For each change mentioned, ask how frequently they do this).

- ☐ Economizer optimization/repair
- ☐ Sensor Calibration
- ☐ Setpoint optimization
- ☐ Balancing
- ☐ Filter changes
- ☐ System diagnostics
- ☐ Sealed leaks / replaced door gaskets
- ☐ Other
- ☐ Don't know

VM3. Please ask for additional information for each change indicated above, such as how frequently the maintenance was performed before and after the course.

VM4. What is the total horsepower of the serviced fans?

VM5. Who can we contact about the technical specifics of the ventilation maintenance practices if needed? Please provide a name, phone number, and email address.

#### Other Maintenance

OM1. You mentioned that you have made some other energy saving changes to your maintenance practices. How likely would you have been to make these improvements to your maintenance practices if you had not attended the course? (Read list)

- ☐ Definitely would have made the improvements
- ☐ Probably would have made the improvements
- ☐ Probably would not have made the improvements
- ☐ Definitely would not have made the improvements
- ☐ Don't know

OM2. Please describe the other maintenance changes that you have made since attending the BOC training? [If needed, prompt with please describe the change in practice and how frequently it is performed]

OM3. Who can we contact about the technical specifics of the other maintenance practices if needed? Please provide a name, phone number, and email address.

Now I would like to ask a few general questions about your experience with the program.

21. Do you think that there are certain barriers that may make it difficult for potential program participants to attend or complete the BOC training? What are they? (Don't read list. *Select all that apply.*)

- ☐ Time
- ☐ Cost

- ☐ Not aware of it
- ☐ Supervisor approval
- ☐ No barriers
- ☐ Don't know

22. Please indicate your level of satisfaction with the following elements of the BOC training.

Element of Experience	Very Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Very Satisfied	Don't know
Course schedule	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Course instructors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tuition rebate application process	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tuition rebate amount	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time elapsed to receive tuition rebate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall experience with the BOC Program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

24A. Please describe the ways in which you were not satisfied with the BOC training or the tuition rebate?

23. For each of the following activities, please indicate if you had already completed them prior to completing BOC training, before and after the training, only completed them after attending BOC training, or have not yet completed them:

Activity	Completed Prior to Training	Completed Before and After Training	Only Completed After Training	Not Yet Completed Them	Don't know
Implemented an energy budget	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recorded energy use over time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Set energy savings goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Achieved energy savings goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

24. Have you participated in any other DCEO energy efficiency programs?

- ☐ Yes (if selected, go to 30A)
- ☐ No
- ☐ Don't know

26A. What other DCEO energy efficiency programs did you participate in?



- 26B. How important was the BOC course in your decision to participate in these other DCEO programs? *(Read list)*
- ☐ Very important
  - ☐ Somewhat important
  - ☐ Neutral
  - ☐ Somewhat unimportant
  - ☐ Not important at all
  - ☐ Don't know/Not applicable
25. What is your current job title? *(Do not read list)*
- ☐ Operations/Facilities operations manager
  - ☐ Maintenance manager
  - ☐ HVAC supervisor or technician
  - ☐ Engineering manager
  - ☐ Facilities manager
  - ☐ Engineer
  - ☐ Maintenance manager
  - ☐ General contractor
  - ☐ Building management specialist
  - ☐ Other engineering position
  - ☐ Other manager, team leader, supervisor
26. How many years have you worked in this role?
27. How many building operator staff is there at your current location?
28. How many of these staff has completed the BOC training (either Level 1 or Level 1&2)?

Thank you for taking this survey of participants in the building operator certification program.

Your response is very important to us.

## Appendix B: Participant Survey Responses

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As part of the evaluation effort, a telephone survey was administered to Building Operator Certification training participants who received a tuition rebate through DCEO. This survey provided the information used in Chapter 3 to estimate free ridership and potential savings for projects in the BOC Program. However, the survey also provided more general information pertaining to the making of decisions to improve energy efficiency by program participants.

Each participant was interviewed using the survey instrument provided in Appendix A. During the interview, a participant was asked questions about (1) his or her general decision making regarding purchasing and installing energy efficient equipment, (2) his or her knowledge of and satisfaction with the BOC Program, and (3) the influence that the BOC Program had on his or her decision to install energy efficiency measures (e.g., lighting measures, HVAC measures, maintenance and operation improvements).

The following tabulations summarize participant survey responses. Three columns of data are presented. The first column presents the number of survey respondents (n) associated with each response. The second column presents the percentage of survey respondents associated with each response.

1. What are the sources your organization relies on for information about energy efficient practices, equipment, materials and design features? (Do not read list. Select all that apply.)	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents*</i>
	DCEO representatives	0	0%
	The DCEO website	3	7%
	Utility representatives	11	27%
	The Midwestern Energy Efficiency Alliance (MEEA)	2	5%
	Brochures or advertisements	0	0%
	Trade associations or business groups you belong to	8	20%
	Trade journals or magazines	4	10%
	Friends and colleagues	13	32%
	The Smart Energy Design Assistance Center (SEDAC)	2	5%
	The Energy Resource Center (ERC)	2	5%
	Architects, engineers or energy consultants	6	15%
	Equipment vendors or building contractors	13	32%
	Other (please describe)	17	41%
	Don't know	3	7%

\*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.

2. How did you learn about the DCEO tuition rebate for the BOC training?	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents*</i>
	From a BOC program representative	7	17%
	A Midwestern Energy Efficiency Alliance (MEEA) representative	1	2%
	A DCEO representative mentioned it	0	0%
	The DCEO website	0	0%
	From a utility representative	5	12%
	Brochures or advertisements	0	0%
	Trade association or business group you belong to	0	0%
	Trade journal or magazine	0	0%
	Friend or colleague	17	41%
	From a representative of Smart Energy Design Assistance Center (SEDAC)	1	2%
	From a representative of the Energy Resource Center (ERC)	0	0%
	An architect, engineer or energy consultant	1	2%
	Equipment vendor or building contractor	1	2%
	Attended a conference workshop or seminar	0	0%
	Past experience with the program	0	0%
	An energy service company	0	0%
	Other (please explain)	6	15%
	Don't know	3	7%

\*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.

3. When you learned about the tuition rebate available for the BOC courses, did you already know about the BOC training?	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
	Yes	20	49%
	No	20	49%
	Don't know	1	2%

4. Which of the following policies or procedures does your organization have in place regarding energy efficiency improvements?	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents*</i>
	An energy management plan	18	44%
	A staff member responsible for energy and energy efficiency	26	63%
	Policies that incorporate energy efficiency in operations and procurement	17	41%
	Active training of staff	26	63%
	Other (please specify)	1	2%
	Don't know	3	7%

\*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.

4A. Does your energy management plan include goals for energy savings?	<i>Response</i>	<i>(n=18)</i>	<i>Percent of Respondents</i>
	Yes	12	67%
	No	4	22%
	Don't know	2	11%

5. What motivated you to participate in the BOC course? (Do not read list. Select all that apply.) (Use as prompts if necessary )	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents*</i>
	Career Opportunity	14	34%
	Learn new skills	24	59%
	Personal interest	20	49%
	Learn about energy efficiency	30	73%
	Other (please specify)	12	29%
	Don't know	0	0%

\*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%

6. How important was the tuition rebate in your decision to participate? (Read list) "	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
	Very important	17	41%
	Somewhat important	10	24%
	Neutral	0	0%
	Only slightly important	3	7%
	Not important at all	10	24%
	Don't know	1	2%

7. Would you have been financially able to attend the BOC training if the tuition rebate had not been available?	<i>Response</i>	<i>(n=40)</i>	<i>Percent of Respondents</i>
	Yes	21	53%
	No	18	45%
	Don't know	1	3%

8. If the tuition rebate had not been available, how likely would you have been to participate in the BOC course anyway? (Read list)"	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
	Definitely would have participated	11	27%
	Probably would have participated	10	24%
	Probably would not have participated	13	32%
	Definitely would not have participated	7	17%
	Don't know	0	0%

9. Were any of the courses you took through the BOC program particularly useful?"	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
	Yes	39	95%
	No	0	0%
	Don't know	2	5%

10. Were there any courses that you found to not be very useful? "	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
	Yes	5	12%
	No	35	85%
	Don't know	1	2%

11. Why did you attend the BOC training? (Do not read list. Select all that apply.) (Use as prompts if necessary )	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents*</i>
	Required by company/organization	16	39%
	To learn new job skills	21	51%
	To advance in my current job	10	24%
	To improve my chances of getting a new job	6	15%
	To earn continuing education credits	4	10%
	To learn about energy efficiency	24	59%
	Because of the tuition rebate	4	10%
	Other (please specify)	6	15%
	Don't know	0	0%

\*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.

12. Have you encountered any barriers to applying what you learned about energy efficiency improvements during the BOC training?"	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
	Yes	8	20%
	No	33	80%
	Don't know	0	0%

12a. What barriers have you encountered? (Do not read list, but use as possible prompts)	<i>Response</i>	<i>(n=8)</i>	<i>Percent of Respondents</i>
	Lack of supervisor support	0	0%
	Insufficient budget	5	63%
	Organization/company not committed to energy efficiency improvements	0	0%
	Not enough staff resources to plan efficiency projects	0	0%
	Other (please specify)	3	38%
	Don't know	0	0%

13. What is the approximate square footage of your building or buildings?	<i>Response</i>	<i>(n=41)</i>	<i>Average square footage</i>
	Average square footage		1242406.4

14. What percentage of that space are you responsible for?	<i>Response</i>	<i>(n=35)</i>	<i>Percent responsible</i>
	Percent responsible		92.1

15. How many hours per week is your site open for business?	<i>Response</i>	<i>(n=40)</i>	<i>Hours per week</i>
	Hours per week		120.2

16. What type of facility is it? ( Do not read list)	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
	College/University	10	24%
	Elementary	0	0%
	Grocery	0	0%
	Healthcare Clinic	0	0%
	Heavy Industry	0	0%
	High School/Middle School	0	0%
	Hospital	4	10%
	Hotel/Motel	0	0%
	Light Industry	0	0%
	Lodging Hotel/Motel	0	0%
	Manufacturing Facility	4	10%
	Medical	0	0%
	Office - High Rise	6	15%
	Office - Low Rise	2	5%
	Office - Mid Rise	1	2%
	Religious Facility	0	0%
	Restaurant	0	0%
	Retail - Department Store	1	2%
	Retail - Strip Mall	0	0%
	Retail/Service	0	0%
	School (K-12)	0	0%
	Warehouse	1	2%
	Other (please specify)	12	29%
	Don't know	0	0%

17. Since participating in the BOC program have you implemented any of the following types of energy efficiency projects? (Read list)	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents*</i>
	Lighting Controls	14	34%
	Energy efficient lighting	21	51%
	NEMA premium energy efficient motors	0	0%
	VSDs	7	17%
	Compressed air projects	0	0%
	Energy management systems	0	0%
	Heating system improvements	13	32%
	Air conditioning improvements	12	29%
	Economizer	3	7%
	Water heating efficiency improvements	2	5%
	Other improvements	4	10%
	None	6	15%
	Don't know	1	2%

\*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.

	<i>Response</i>	<i>(n=34)</i>	<i>Percent of Respondents</i>
19. At how many facilities did you implement any of the previously listed projects?	1	18	53%
	2	5	15%
	3	0	0%
	4	3	9%
	5	1	3%
	6	0	0%
	7	1	3%
	8	0	0%
	9	2	6%
	10 or more	4	12%
	Don't know	0	0%

	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents</i>
LC1. Now I would like to ask you some questions about the lighting controls you implemented. How likely is it that you would have made these improvements had you had not attended the course? (Read list)	Definitely would have made the improvements	5	36%
	Probably would have made the improvements	7	50%
	Probably would not have made the improvements	2	14%
	Definitely would not have made the improvements	0	0%
	Don't know (Don't read)	0	0%

	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents</i>
LC2. Had you implemented a similar project prior to attending the BOC training?	Yes	9	64%
	No	5	36%
	Don't know	0	0%

	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents</i>
LC3. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?	Yes	6	43%
	No	6	43%
	Don't know	2	14%

	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents*</i>
LC4. What type of new lighting controls did you implement? (Do not read list)	Occupancy sensors	12	86%
	Daylighting	4	29%
	Don't know	0	0%

\*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%



	<i>Response</i>	<i>(n=21)</i>	<i>Percent of Respondents</i>
EEL1. Now I would like to ask you some questions about the energy efficient lighting you implemented. How likely is it that you would have made these improvements had you had not attended the course? (Read list)	Definitely would have made the improvements	7	33%
	Probably would have made the improvements	10	48%
	Probably would not have made the improvements	4	19%
	Definitely would not have made the improvements	0	0%
	Don't know	0	0%

	<i>Response</i>	<i>(n=21)</i>	<i>Percent of Respondents</i>
EEL2. How many lighting projects did you complete?	1	8	38%
	2	4	19%
	3	3	14%
	4	2	10%
	5	2	10%
	6	0	0%
	7	0	0%
	8	0	0%
	9	1	5%
	10 or more	1	5%
	Don't know	0	0%

	<i>Response</i>	<i>(n=21)</i>	<i>Percent of Respondents</i>
EEL3. Had you implemented a similar project prior to attending the BOC training?	Yes	14	67%
	No	7	33%
	Don't know	0	0%

	<i>Response</i>	<i>(n=21)</i>	<i>Percent of Respondents</i>
EEL4. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?	Yes	14	67%
	No	5	24%
	Don't know	2	10%

	<i>Response</i>	<i>(n=2)</i>	<i>Percent of Respondents</i>
EEM1. Now I would like to ask you some questions about the energy efficient motors you implemented. How likely is it that you would have made these improvements had you had not attended the course? (Read list)	Definitely would have made the improvements	1	50%
	Probably would have made the improvements	0	0%
	Probably would not have made the improvements	1	50%
	Definitely would not have made the improvements	0	0%
	Don't know (Don't read)	0	0%

EEM2. Had you implemented a similar project prior to attending the BOC training?	<i>Response</i>	<i>(n=2)</i>	<i>Percent of Respondents</i>
	Yes	0	0%
	No	2	100%
	Don't know	0	0%

EEM3. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?	<i>Response</i>	<i>(n=2)</i>	<i>Percent of Respondents</i>
	Yes	0	0%
	No	2	100%
	Don't know	0	0%

EEM4. Were these motors installed for HVAC end-uses or for industrial end-uses? (select all that apply)	<i>Response</i>	<i>(n=2)</i>	<i>Percent of Respondents*</i>
	HVAC end-use	2	100%
	Industrial end-use	0	0%
	Don't know	0	0%

\*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.

VSD1. Now I would like to ask you some questions about the VSDs you implemented. How likely is it that you would have made these improvements had you not attended the course? (Read list)	<i>Response</i>	<i>(n=7)</i>	<i>Percent of Respondents</i>
	Definitely would have made the improvements	1	14%
	Probably would have made the improvements	4	57%
	Probably would not have made the improvements	1	14%
	Definitely would not have made the improvements	0	0%
	Don't know	1	14%

VSD2. Had you implemented a similar project prior to attending the BOC training?	<i>Response</i>	<i>(n=7)</i>	<i>Percent of Respondents</i>
	Yes	5	71%
	No	2	29%
	Don't know	0	0%

VSD3. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?	<i>Response</i>	<i>(n=7)</i>	<i>Percent of Respondents</i>
	Yes	3	43%
	No	3	43%
	Don't know	1	14%

VSD4. Were the VSDs installed on existing motors part of an HVAC system?	<i>Response</i>	<i>(n=7)</i>	<i>Percent of Respondents</i>
	Yes	5	71%
	No	1	14%
	Don't know	1	14%

CA1. Now I would like to ask you some questions about the compressed air projects you implemented. How likely is it that you would have made these improvements had you not attended the course? (Read list)	<i>Response</i>	<i>(n=0)</i>	<i>Percent of Respondents</i>
	Definitely would have made the improvements	0	0%
	Probably would have made the improvements	0	0%
	Probably would not have made the improvements	0	0%
	Definitely would not have made the improvements	0	0%
	Don't know (Don't read)	0	0%

CA2. Had you implemented a similar project prior to attending the BOC training?	<i>Response</i>	<i>(n=0)</i>	<i>Percent of Respondents</i>
	Yes	0	0%
	No	0	0%
	Don't know	0	0%

CA3. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?	<i>Response</i>	<i>(n=0)</i>	<i>Percent of Respondents</i>
	Yes	0	0%
	No	0	0%
	Don't know	0	0%

EMS1. Now I would like to ask you some questions about the energy management system(s) you implemented. How likely is it that you would have made these improvements had you not attended the course? (Read list)	<i>Response</i>	<i>(n=8)</i>	<i>Percent of Respondents</i>
	Definitely would have made the improvements	2	25%
	Probably would have made the improvements	5	63%
	Probably would not have made the improvements	1	13%
	Definitely would not have made the improvements	0	0%
	Don't know (Don't read)	0	0%

EMS2. Had you implemented a similar project prior to attending the BOC training?	<i>Response</i>	<i>(n=8)</i>	<i>Percent of Respondents</i>
	Yes	3	38%
	No	5	63%
	Don't know	0	0%

EMS3. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?	<i>Response</i>	<i>(n=8)</i>	<i>Percent of Respondents</i>
	Yes	2	25%
	No	4	50%
	Don't know	2	25%

EMS5. Did you install a new energy management system after the BOC training?	<i>Response</i>	<i>(n=8)</i>	<i>Percent of Respondents</i>
	Yes	4	50%
	No	4	50%
	Don't know	0	0%

EMS6. Did you make changes to an existing energy management system after the BOC training?	<i>Response</i>	<i>(n=8)</i>	<i>Percent of Respondents</i>
	Yes	4	50%
	No	2	25%
	Don't know	2	25%

HS1. Now I would like to ask you some questions about the heating system improvements you implemented. How likely is it that you would have made these improvements had you not attended the course? (Read list)	<i>Response</i>	<i>(n=13)</i>	<i>Percent of Respondents</i>
	Definitely would have made the improvements	5	38%
	Probably would have made the improvements	5	38%
	Probably would not have made the improvements	3	23%
	Definitely would not have made the improvements	0	0%
	Don't know (Don't read)	0	0%

HS2. Had you implemented a similar project prior to attending the BOC training?	<i>Response</i>	<i>(n=13)</i>	<i>Percent of Respondents</i>
	Yes	9	69%
	No	4	31%
	Don't know	0	0%

HS3. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?	<i>Response</i>	<i>(n=13)</i>	<i>Percent of Respondents</i>
	Yes	7	54%
	No	5	38%
	Don't know	1	8%

	<i>Response</i>	<i>(n=13)</i>	<i>Percent of Respondents*</i>
HS4. What is the primary heating system type for the system you made improvements to? (Do not read list) (Select all that apply)	Hot air furnace	2	15%
	Wall or floorboard radiator (steam, Hot Water or electric resistance)	3	23%
	Steam, hot water or electric resistance coils in ventilation system.	4	31%
	Space heaters	0	0%
	Heat pump, air source	0	0%
	Heat pump, ground source	0	0%
	Heat pump, water loop	0	0%
	Electric boiler	0	0%
	Gas boiler	1	8%
	Other (please specify)	3	23%
	Don't know	0	0%

\*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.

	<i>Response</i>	<i>(n=12)</i>	<i>Percent of Respondents</i>
AC1. Now I would like to ask you some questions about the air conditioning improvements you implemented. How likely is it that you would have made these improvements had you not attended the course?	Definitely would have made the improvements	2	17%
	Probably would have made the improvements	8	67%
	Probably would not have made the improvements	1	8%
	Definitely would not have made the improvements	1	8%
	Don't know (Don't read)	0	0%

	<i>Response</i>	<i>(n=12)</i>	<i>Percent of Respondents</i>
AC2. Had you implemented a similar project prior to attending the BOC training?	Yes	7	58%
	No	5	42%
	Don't know	0	0%

	<i>Response</i>	<i>(n=12)</i>	<i>Percent of Respondents</i>
AC3. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?	Yes	7	58%
	No	4	33%
	Don't know	1	8%

AC4. What is the primary cooling system type for the system you made improvements to?	<i>Response</i>	<i>(n=12)</i>	<i>Percent of Respondents*</i>
	Chiller - air-cooled	1	8%
	Chiller - water or evaporatively cooled	8	67%
	Evaporative cooler	0	0%
	Fans	0	0%
	Direct Expansion - air-cooled packaged or split system cooling or heat pump	2	17%
	Geothermal heat pump	0	0%
	Window or thermal units (PTAC/PTHP)	0	0%
	Other (please specify)	1	8%
	Don't know	0	0%

\*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.

E1. Now I would like to ask you some questions about the economizers you implemented. How likely is it that you would have made these improvements had you had not attended the course?	<i>Response</i>	<i>(n=3)</i>	<i>Percent of Respondents</i>
	Definitely would have made the improvements	1	33%
	Probably would have made the improvements	2	67%
	Probably would not have made the improvements	0	0%
	Definitely would not have made the improvements	0	0%
	Don't know	0	0%

E2. Had you implemented a similar project prior to attending the BOC training?	<i>Response</i>	<i>(n=3)</i>	<i>Percent of Respondents</i>
	Yes	3	100%
	No	0	0%
	Don't know	0	0%

E3. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?	<i>Response</i>	<i>(n=3)</i>	<i>Percent of Respondents</i>
	Yes	3	100%
	No	0	0%
	Don't know	0	0%

	<i>Response</i>	<i>(n=2)</i>	<i>Percent of Respondents</i>
WH1. Now I would like to ask you some questions about the water heating improvements you implemented. How likely is it that you would have made these improvements had you had not attended the course? (Read list)	Definitely would have made the improvements	1	50%
	Probably would have made the improvements	1	50%
	Probably would not have made the improvements	0	0%
	Definitely would not have made the improvements	0	0%
	Don't know (Don't read)	0	0%

	<i>Response</i>	<i>(n=2)</i>	<i>Percent of Respondents</i>
WH2. Had you implemented a similar project prior to attending the BOC training?	Yes	1	50%
	No	1	50%
	Don't know	0	0%

	<i>Response</i>	<i>(n=2)</i>	<i>Percent of Respondents</i>
WH3. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?	Yes	0	0%
	No	2	100%
	Don't know	0	0%

	<i>Response</i>	<i>(n=2)</i>	<i>Percent of Respondents*</i>
WH4. What type of water heating improvements that produced energy savings did you implement? (Do not read list. Select all that apply)	Installed timeclock to turn off circulation pump after hours	0	0%
	Installed heat recovery system	0	0%
	Installed a more efficient hot water heater or boiler?	1	50%
	Insulated pipes(s) (How thick was the insulation and how many linear feet were installed?)	0	0%
	Other	1	50%
	Don't know	0	0%

\*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.

	<i>Response</i>	<i>(n=4)</i>	<i>Percent of Respondents</i>
O1. Now I would like to ask you some questions about the other projects you implemented. How likely is it that you would have made these improvements had you had not attended the course? (Read list)	Definitely would have made the improvements	1	25%
	Probably would have made the improvements	1	25%
	Probably would not have made the improvements	2	50%
	Definitely would not have made the improvements	0	0%
	Don't know	0	0%

	<i>Response</i>	<i>(n=4)</i>	<i>Percent of Respondents</i>
O2. Had you implemented a similar project prior to attending the BOC training?	Yes	2	50%
	No	2	50%
	Don't know	0	0%

	<i>Response</i>	<i>(n=4)</i>	<i>Percent of Respondents</i>
O3. Have you received or applied for a financial incentive from a utility or the Illinois DCEO for this project?	Yes	1	25%
	No	2	50%
	Don't know	1	25%

	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
21A. Please indicate if you have performed maintenance on the cooling system equipment differently or more frequently or both since participating in the BOC training. Maintenance on the cooling system.	Differently	2	5%
	More Frequently	7	17%
	Both	1	2%
	No Change	27	66%
	Don't know	4	10%

	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
21B. Please indicate if you have performed maintenance on the heating equipment differently or more frequently or both since participating in the BOC training. Maintenance on the heating equipment.	Differently	0	0%
	More Frequently	7	17%
	Both	2	5%
	No Change	28	68%
	Don't know	4	10%

	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
21C. Please indicate if you have performed maintenance on motors (including belt alignment and tension) differently or more frequently or both since participating in the BOC training. Motor maintenance, including belt alignment and tension.	Differently	0	0%
	More Frequently	8	20%
	Both	2	5%
	No Change	27	66%
	Don't know	4	10%



21D. Please indicate if you have performed maintenance on compressed air systems differently or more frequently or both since participating in the BOC training. Maintenance on compressed air system.	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
	Differently	0	0%
	More Frequently	4	10%
	Both	1	2%
	No Change	25	61%
	Don't know	11	27%

21E. Please indicate if you have performed electrical panel maintenance differently or more frequently or both since participating in the BOC training. Electrical panel maintenance.	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
	Differently	0	0%
	More Frequently	6	15%
	Both	1	2%
	No Change	28	68%
	Don't know	6	15%

21F. Please indicate if you have performed ventilation maintenance differently or more frequently or both since participating in the BOC training. Ventilation maintenance.	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
	Differently	2	5%
	More Frequently	7	17%
	Both	1	2%
	No Change	27	66%
	Don't know	4	10%

21G. Please indicate if you have performed other energy savings maintenance differently or more frequently or both since participating in the BOC training. Other maintenance.	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
	Differently	0	0%
	More Frequently	3	7%
	Both	0	0%
	No Change	34	83%
	Don't know	4	10%

22. At how many facilities did you make these changes to your maintenance practices?	<i>Response</i>	<i>(n=19)</i>	<i>Percent of Respondents</i>
	1	11	58%
	2	1	5%
	3	1	5%
	4	2	11%
	5	0	0%
	6	0	0%
	7	2	11%
	8	0	0%
	9	0	0%
	10 or more	1	5%
	Don't know	1	5%

	<i>Response</i>	<i>(n=10)</i>	<i>Percent of Respondents</i>
CS1. You mentioned that you have changed how you perform maintenance on cooling system equipment since taking the BOC training. How likely would you have been to make these improvements to your maintenance practices if you had not attended the course?	Definitely would have made the improvements	1	10%
	Probably would have made the improvements	4	40%
	Probably would not have made the improvements	4	40%
	Definitely would not have made the improvements	1	10%
	Don't know	0	0%

	<i>Response</i>	<i>(n=10)</i>	<i>Percent of Respondents*</i>
CS2. What type of air conditioning improvements that produced energy savings did you implement?(Do not read list. Select all that apply)	Changes to cooling tower service	1	10%
	Changes to chiller bundle cleaning	3	30%
	Changes to condenser cleaning	3	30%
	Changes to refrigerant charge adjustment	1	10%
	Other changes	6	60%
	Don't know	1	10%

\*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.

	<i>Response</i>	<i>(n=9)</i>	<i>Percent of Respondents</i>
HE1. You mentioned that you have changed how you perform maintenance on heating equipment since taking the BOC training. How likely would you have been to make these improvements to your maintenance practices if you had not attended the course? (Read list)	Definitely would have made the improvements	1	11%
	Probably would have made the improvements	4	44%
	Probably would not have made the improvements	4	44%
	Definitely would not have made the improvements	0	0%
	Don't know	0	0%

	<i>Response</i>	<i>(n=9)</i>	<i>Percent of Respondents*</i>
HE2. What type of air conditioning improvements that produced energy savings did you implement?(Do not read list. Select all that apply)	Heat exchanger cleaning (Please provide capacity in BTU's)	3	33%
	Blowdown frequency (Please provide boiler capacity in BTU's and number of traps)	3	33%
	Steam trap	3	33%
	Other	4	44%
	Don't know	0	0%

\*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.

AC1. You mentioned that you have changed how you perform maintenance on air compressor equipment since taking the BOC training. How likely would you have been to make these improvements to your maintenance practices if you had not attended the course? (Read list)	<i>Response</i>	<i>(n=5)</i>	<i>Percent of Respondents</i>
	Definitely would have made the improvements	1	20%
	Probably would have made the improvements	2	40%
	Probably would not have made the improvements	2	40%
	Definitely would not have made the improvements	0	0%
	Don't know	0	0%

AC2. Please tell me all the changes you have made to your air compressor equipment maintenance. (Do not read list. Select all that apply)	<i>Response</i>	<i>(n=5)</i>	<i>Percent of Respondents*</i>
	Audible leak detection	0	0%
	Ultra-sonic leak detection	0	0%
	Pressure optimization	0	0%
	End-use isolation	0	0%
	Filter changes	3	60%
	System diagnostics	1	20%
	Other (please specify)	2	40%
	Don't know	0	0%

\*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.

VM1. You mentioned that you have changed how you perform ventilation maintenance since taking the BOC training. How likely would you have been to make these improvements to your maintenance practices if you had not attended the course? (Read list)	<i>Response</i>	<i>(n=10)</i>	<i>Percent of Respondents</i>
	Definitely would have made the improvements	1	10%
	Probably would have made the improvements	3	30%
	Probably would not have made the improvements	6	60%
	Definitely would not have made the improvements	0	0%
	Don't know	0	0%

VM2. What type of air conditioning improvements that produced energy savings did you implement?(Do not read list. Select all that apply)	<i>Response</i>	<i>(n=10)</i>	<i>Percent of Respondents*</i>
	Economizer optimization/repair	2	20%
	Sensor Calibration	1	10%
	Setpoint optimization	2	20%
	Balancing	1	10%
	Filter changes	4	40%
	System diagnostics	1	10%
	Sealed leaks / replaced door gaskets	1	10%
	Other (please specify)	4	40%
	Don't know	0	0%

\*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.

OM1. You mentioned that you have changed how you perform other types of maintenance since taking the BOC training. How likely would you have been to make these improvements to your maintenance practices if you had not attended the course? (Read list)	<i>Response</i>	<i>(n=0)</i>	<i>Percent of Respondents</i>
	Definitely would have made the improvements	0	0%
	Probably would have made the improvements	0	0%
	Probably would not have made the improvements	0	0%
	Definitely would not have made the improvements	0	0%
	Don't know	0	0%

23. Do you think that there are certain barriers that may make it difficult for potential program participants to attend or complete the BOC training? What are they? (Don't read list. Select all that apply.)	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents*</i>
	Time	16	39%
	Cost	12	29%
	Not aware of it	6	15%
	Supervisor approval	5	12%
	No barriers	12	29%
	Don't know	3	7%

\*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.

24A. Please indicate your level of satisfaction with the following elements of the BOC training. Course schedule.	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
	Very Dissatisfied	0	0%
	Dissatisfied	0	0%
	Neither Satisfied nor Dissatisfied	1	2%
	Satisfied	24	59%
	Very Satisfied	16	39%
	Don't know	0	0%

24B. Please indicate your level of satisfaction with the following elements of the BOC training. Course instructors.	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
	Very Dissatisfied	0	0%
	Dissatisfied	1	2%
	Neither Satisfied nor Dissatisfied	0	0%
	Satisfied	20	49%
	Very Satisfied	20	49%
	Don't know	0	0%

	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
24C. Please indicate your level of satisfaction with the following elements of the BOC training. Tuition rebate application process.	Very Dissatisfied	0	0%
	Dissatisfied	0	0%
	Neither Satisfied nor Dissatisfied	3	7%
	Satisfied	13	32%
	Very Satisfied	17	41%
	Don't know	8	20%

	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
24D. Please indicate your level of satisfaction with the following elements of the BOC training. Tuition rebate amount.	Very Dissatisfied	0	0%
	Dissatisfied	0	0%
	Neither Satisfied nor Dissatisfied	3	7%
	Satisfied	16	39%
	Very Satisfied	13	32%
	Don't know	9	22%

	<i>Response</i>	<i>(n=40)</i>	<i>Percent of Respondents</i>
24E. Please indicate your level of satisfaction with the following elements of the BOC training. Time elapsed to receive tuition rebate.	Very Dissatisfied	0	0%
	Dissatisfied	0	0%
	Neither Satisfied nor Dissatisfied	4	10%
	Satisfied	20	49%
	Very Satisfied	7	17%
	Don't know	9	22%

	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
24F. Please indicate your level of satisfaction with the following elements of the BOC training. Overall experience with the BOC Program.	Very Dissatisfied	0	0%
	Dissatisfied	0	0%
	Neither Satisfied nor Dissatisfied	0	0%
	Satisfied	16	39%
	Very Satisfied	25	61%
	Don't know	0	0%

	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
25A. Please indicate if you had already completed energy budget implementation prior to completing BOC training, before and after the training, only completed them after attending BOC training, or have not yet completed.	Completed Prior to Training	11	27%
	Completed Before and After Training	7	17%
	Only Completed After Training	2	5%
	Not Yet Completed Them	11	27%
	Don't know	10	24%

25B. Please indicate if you had already recorded energy use over time prior to completing BOC training, before and after the training, only completed them after attending BOC training, or have not yet completed.	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
	Completed Prior to Training	17	41%
	Completed Before and After Training	6	15%
	Only Completed After Training	7	17%
	Not Yet Completed Them	6	15%
	Don't know	5	12%

25C. Please indicate if you had already set energy savings goals prior to completing BOC training, before and after the training, only completed them after attending BOC training, or have not yet completed.	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
	Completed Prior to Training	15	37%
	Completed Before and After Training	5	12%
	Only Completed After Training	7	17%
	Not Yet Completed Them	10	24%
	Don't know	4	10%

25D. Please indicate if you had already achieved energy savings goals prior to completing BOC training, before and after the training, only completed them after attending BOC training, or have not yet completed.	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
	Completed Prior to Training	9	22%
	Completed Before and After Training	6	15%
	Only Completed After Training	8	20%
	Not Yet Completed Them	14	34%
	Don't know	4	10%

26. Have you participated in any other DCEO energy efficiency programs?	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
	Yes	2	5%
	No	38	93%
	Don't know	1	2%

26B. How important was the BOC course in your decision to participate in these other DCEO programs? (Read list)	<i>Response</i>	<i>(n=2)</i>	<i>Percent of Respondents</i>
	Very important	0	0%
	Somewhat important	0	0%
	Neutral	1	50%
	Somewhat unimportant	0	0%
	Not important at all	1	50%
	Don't know/Not applicable	0	0%

27. What is your current job title? (Do not read list)	<i>Response</i>	<i>(n=41)</i>	<i>Percent of Respondents</i>
	Operations/Facilities operations manager	4	10%
	Maintenance manager	0	0%
	HVAC supervisor or technician	1	2%
	Engineering manager	3	7%
	Facilities manager	3	7%
	Engineer	12	29%
	Maintenance manager	3	7%
	General contractor	1	2%
	Building management specialist	0	0%
	Other engineering position	5	12%
	Other manager, team leader, supervisor	9	22%

  

28. How many years have you worked in this role?	<i>(n=40)</i>	
	Average Years	12.2

  

29. How many building operator staff is there at your current location?	<i>(n=41)</i>	
	Average Staff	13.7

  

30. How many of these staff have completed the BOC training (either Level 1 or Level 1&2)?	<i>(n=41)</i>	
	Average BOC Completion	4.3

## Appendix C: Questionnaire for Supervisor Survey

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1. According to our records [number] of your employees completed the Building Operator Certification Course. Specifically, our records indicate that [employee name] attended the course. Is this correct?
- ☐ Yes
- ☐ No (If selected, go to follow up)
- ☐ Don't know (If selected, go to follow up)

- 1A. Did you have one or more employees attend the building operator certification course between June 1 2012 and May 31 2013?
- ☐ Yes (If selected, go to 1A.1)
- ☐ No (If selected, go to 1A.2)
- ☐ Don't know (If selected, go to 1A.2)

1A.1. What are their name(s)?

1A.2. We do not have any further questions for you.

Please scroll to the end of the survey and click submit.

1. How useful would you say the Building Operator Certification course was for helping your employees perform better in the following areas?

	Very Useful	Somewhat Useful	Not Useful	Don't know / Not Applicable
Identifying energy efficiency improvements				
Monitoring facility energy use				
Improving maintenance practices				
Identifying ways to improve occupant comfort				

- 1A. Was the course useful for helping your [employee/employees] perform better at other aspects of their job?
- 1B. (if any marked not at all useful) Could you explain more about why you think the course was not useful in improving certain areas of your employee's(s') job performance?
2. From what you have observed, [has your employee / have your employees] used or applied any of the concepts and/or methods taught in the Building Operator Certification courses?
- ☐ Yes
- ☐ No



☐ Don't know

3. Since completing the Building Operator Certification, [has your employee / have your employees] undertaken or recommended any of the following energy efficiency projects?

	Undertaken	Recommended	Don't Know
Installation of lighting controls			
Installation of energy efficient lighting			
Installation of variable speed drives or variable frequency drives			
Energy saving improvements to compressed air systems			
Energy management system projects			
Energy saving improvements to heating system			
Energy saving improvements to cooling system			
Energy saving economizer project			
Water heating efficiency improvements			

4. Since completing the Building Operator Certification, [has your employee/have your employees] undertaken or recommended any other energy saving improvements not mentioned above?
- ☐ Yes  
☐ No  
☐ Don't know
- 4A. What other energy projects [has your employee / have your employees] undertaken or recommended since attending the Building Operator Certification courses? Please specify whether these projects were undertaken or recommended?
5. [Has your employee / Have your employees] performed any new operation and maintenance actions since completing the Building Operator Certification?
- ☐ Yes  
☐ No  
☐ Don't know
- 5B. What new operations and maintenance activities [has your employee / have your employees] performed since completing the Certification?
6. Would you say that your [employee performs / employees perform] performs some past operation and maintenance more often since completing the Building Operator Certification?
- ☐ Yes  
☐ No  
☐ Don't know

- 6B. What activities [has your employee / have your employees] performed more often since completing the Certification?
7. Would you say that your [employee performs / employees perform] some past operation and maintenance activities better since attending the course?
- ☐ Yes  
☐ No  
☐ Don't know
- 7A. What activities [has your employee / have your employees] performed better since completing the Certification?
8. Does your organization face any of the following barriers to making energy efficiency improvements? (Select all that apply)
- ☐ Organization/company not committed to energy efficiency improvements  
☐ Lack of knowledge about ways to save energy  
☐ Not enough staff resources to plan efficiency projects  
☐ Other (Please specify)  
☐ Don't know
9. Since attending the Building Operator Certification courses [Has your employee / Have your employees] shared what was learned with other employees?
- ☐ Yes (If selected, go to 9A)  
☐ No  
☐ Don't know
- 9A. How [has your employee / have your employees] shared the information learned in the course with other employees? (Select all that apply)
- ☐ On the job demonstration of concepts or methods  
☐ Verbal explanation of concepts or methods  
☐ Written explanation of concepts or methods  
☐ Shared course materials  
☐ Don't know  
☐ Other \_\_\_\_\_
10. Based on your observations, has the Building Operator Certification training course led to your [employee / employees] having increased value to your organization in terms of the following?

	Yes	No	Don't Know
Saving energy at your facility?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Saving money?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Helping to improve occupant comfort?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advising in decisions about equipment operation or replacement?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Having more productive interactions with contractors?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Undertaking, recommending, or influencing any energy-efficiency projects?			

11. If you were hiring a new employee, how important would the candidates having a building operator certificate be to your hiring decision?
  - ☐ Very important
  - ☐ Important
  - ☐ Not important
  - ☐ Not at all important
  - ☐ Don't know
  
12. For current employees, how important is having a building operator certificate for promotion and/or advancement?
  - ☐ Very important
  - ☐ Important
  - ☐ Not important
  - ☐ Not at all important
  - ☐ Don't know
  
13. What do you consider in deciding whether or not to send your employees to the Building Operator Certification Program training course? (Select all that apply)
  - ☐ Time/staff availability
  - ☐ Training costs
  - ☐ Location of the training
  - ☐ Instructor/sponsor for the training
  - ☐ Length of training
  - ☐ Your organization's approval process for sending employees to training
  - ☐ Employee professional development
  - ☐ Legal requirements
  - ☐ Gain/benefits for company of certification
  - ☐ The employee's personal interest
  - ☐ Other
  - ☐ Don't know
  
14. How important was the rebate to the decision to send your [employee / employees] to the Building Operator Certification courses?
  - ☐ Very important
  - ☐ Important
  - ☐ Not important
  - ☐ Not at all important
  - ☐ Don't know
  
15. Would your [employee / employees] have been sent to the Building Operator Certification course if the rebate was not available?
  - ☐ Definitely would have

- ☐ Probably would have
  - ☐ Probably would not have
  - ☐ Definitely would not have
  - ☐ Don't know
16. Do you think your [employee's/employees'] training in the Building Operator Certification Program training course has increased the likelihood that your organization will participate in energy efficiency programs, such as equipment incentive programs?
- ☐ Yes (If selected, go to 16A)
  - ☐ No (If selected, go to 16B)
  - ☐ Don't know
- 16 A. Why has it increased the likelihood of participating in the energy efficiency programs?
- 16B. Why has it not increased the likelihood of participating in energy efficiency programs?
17. Do you think your (employee's / employees') training in the Building Operator Certification Program training course has increased the likelihood that your organization will make investments in energy efficiency?
- ☐ Yes (If selected, go to 17A)
  - ☐ No (If selected, go to 17B)
  - ☐ Don't know
- 17A. Why has it increased the likelihood that your organization will make investments in energy efficiency?
- 17B. Why has it not increased the likelihood that your organization will make investments in energy efficiency?
18. Would you recommend the Building Operator Certificate Program to any of your colleagues in your organization or in other organizations?
- ☐ Yes
  - ☐ No (If selected, go to 18A)
  - ☐ Don't know
- 18A. Why would you not recommend the Building Operator Certification Program to your colleagues?
19. Do you expect your organization to enroll any other staff at your facility in the Building Operator Certificate Program?
- ☐ Yes
  - ☐ No (If selected, go to 19A)
  - ☐ Don't know
- 19A. Why do you not expect your organization to enroll any more staff in the Building Operator Certification Program to your colleagues?

## Appendix D: Supervisor Survey Responses

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As part of the evaluation effort, a telephone survey was administered to supervisors of employees who had enrolled in and completed the BOC training courses. This survey provided information that was used to supplement the process evaluation, such as gauging supervisor knowledge, interest, and perceived value of the BOC training courses, and determining to what extent their employees had applied the knowledge gained through the program.

Each supervisor was interviewed using the survey instrument provided in Appendix C. During the interview, a respondent was asked questions about (1) the overall usefulness of the BOC courses, (2) his or her employees' actions and skill levels following BOC completion, (3) barriers to implementing energy efficiency improvements in his or her facility, and (4) whether he or she would consider sending additional employees to the program, and why or why not.

The following tabulations summarize participant survey responses. Three columns of data are presented. The first column presents the number of survey respondents (n) associated with each response. The second column presents the percentage of survey respondents associated with each response.

1a. How useful would you say the Building Operator Certification course was for helping your employees perform better in identifying energy efficiency improvements?	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents</i>
	Very useful	7	50%
	Somewhat useful	6	43%
	Not useful	0	0%
	Don't know/Not applicable	0	0%

1b. How useful would you say the Building Operator Certification course was for helping your employees perform better in monitoring facility energy use?	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents</i>
	Very useful	5	36%
	Somewhat useful	8	57%
	Not useful	0	0%
	Don't know/Not applicable	0	0%

1c. How useful would you say the Building Operator Certification course was for helping your employees perform better in improving maintenance practices?	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents</i>
	Very useful	5	36%
	Somewhat useful	8	57%
	Not useful	0	0%
	Don't know/Not applicable	0	0%

1d. How useful would you say the Building Operator Certification course was for helping your employees perform better in identifying ways to improve occupant comfort?	<i>Response</i>	<i>(n=13)</i>	<i>Percent of Respondents</i>
	Very useful	4	31%
	Somewhat useful	8	62%
	Not useful	0	0%
	Don't know/Not applicable	0	0%

2. From what you have observed, [has your employee / have your employees] used or applied any of the concepts and/or methods taught in the Building Operator Certification courses?	<i>Response</i>	<i>(n=13)</i>	<i>Percent of Respondents</i>
	Yes	12	92%
	No	0	0%
	Don't know	1	8%

3a. Since completing the Building Operator Certification, [has your employee / have your employees] undertaken or recommended installation of lighting controls?	<i>Response</i>	<i>(n=10)</i>	<i>Percent of Respondents</i>
	Undertaken	5	50%
	Recommended	3	30%
	Don't know	2	20%

3b. Since completing the Building Operator Certification, [has your employee / have your employees] undertaken or recommended installation of energy efficient lighting?	<i>Response</i>	<i>(n=12)</i>	<i>Percent of Respondents</i>
	Undertaken	5	42%
	Recommended	6	50%
	Don't know	1	8%

3c. Since completing the Building Operator Certification, [has your employee / have your employees] undertaken or recommended installation of variable speed drives or variable frequency drives?	<i>Response</i>	<i>(n=11)</i>	<i>Percent of Respondents</i>
	Undertaken	3	27%
	Recommended	4	36%
	Don't know	4	36%

3d. Since completing the Building Operator Certification, [has your employee / have your employees] undertaken or recommended energy saving improvements to compressed air systems?	<i>Response</i>	<i>(n=10)</i>	<i>Percent of Respondents</i>
	Undertaken	1	10%
	Recommended	4	40%
	Don't know	5	50%

3e. Since completing the Building Operator Certification, [has your employee / have your employees] undertaken or recommended energy management system projects?	<i>Response</i>	<i>(n=9)</i>	<i>Percent of Respondents</i>
	Undertaken	1	11%
	Recommended	4	44%
	Don't know	4	44%

3f. Since completing the Building Operator Certification, [has your employee / have your employees] undertaken or recommended energy saving improvements to heating system?	<i>Response</i>	<i>(n=10)</i>	<i>Percent of Respondents</i>
	Undertaken	0	0%
	Recommended	6	60%
	Don't know	4	40%

3g. Since completing the Building Operator Certification, [has your employee / have your employees] undertaken or recommended energy saving improvements to cooling system?	<i>Response</i>	<i>(n=10)</i>	<i>Percent of Respondents</i>
	Undertaken	1	10%
	Recommended	5	50%
	Don't know	4	40%

3h. Since completing the Building Operator Certification, [has your employee / have your employees] undertaken or recommended energy saving economizer project?	<i>Response</i>	<i>(n=9)</i>	<i>Percent of Respondents</i>
	Undertaken	2	22%
	Recommended	2	22%
	Don't know	5	56%

3i. Since completing the Building Operator Certification, [has your employee / have your employees] undertaken or recommended water heating efficiency improvements?	<i>Response</i>	<i>(n=9)</i>	<i>Percent of Respondents</i>
	Undertaken	1	11%
	Recommended	4	44%
	Don't know	4	44%

4. Since completing the Building Operator Certification, [has your employee/have your employees] undertaken or recommended any other energy saving improvements not mentioned above?	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents</i>
	Yes	2	14%
	No	8	57%
	Don't know	4	29%

5. [Has your employee / Have your employees] performed any new operation and maintenance actions since completing the Building Operator Certification?	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents</i>
	Yes	5	36%
	No	4	29%
	Don't know	5	36%

6. Would you say that your [employee performs / employees perform] some past operation and maintenance more often since completing the Building Operator Certification?	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents</i>
	Yes	3	21%
	No	3	21%
	Don't know	8	57%

7. Would you say that your [employee performs / employees perform] some past operation and maintenance activities better since attending the course?	<i>Response</i>	<i>(n=13)</i>	<i>Percent of Respondents</i>
	Yes	4	31%
	No	2	15%
	Don't know	7	54%



	<i>Response</i>	<i>(n=13)</i>	<i>Percent of Respondents</i>
8. Does your organization face any of the following barriers to making energy efficiency improvements?	Organization/company not committed to energy efficiency improvements	2	15%
	Lack of knowledge about ways to save energy	0	0%
	Not enough financial resources for energy efficiency projects	6	46%
	Not enough staff resources to plan efficiency projects	3	23%
	Other (Please specify)	3	23%
	Don't know	1	8%

	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents</i>
9. Since attending the Building Operator Certification courses, [question("value"), id="19"] shared what was learned with other employees?	Yes	8	57%
	No	0	0%
	Don't know	6	43%

	<i>Response</i>	<i>(n=8)</i>	<i>Percent of Respondents</i>
8. What barriers does your facility face to completing energy efficiency improvements at your facility?	On the job demonstration of concepts or methods	2	15%
	Verbal explanation of concepts or methods	5	38%
	Written explanation of concepts or methods	0	0%
	Shared course materials	3	23%
	Other	1	8%
	Don't know	0	0%

	<i>Response</i>	<i>(n=13)</i>	<i>Percent of Respondents</i>
10a. Based on your observations, has the Building Operator Certification training course led to your [employee / employees] having increased value to your organization in terms of saving energy at your facility?	Yes	12	92%
	No	1	8%
	Don't know	0	0%

	<i>Response</i>	<i>(n=12)</i>	<i>Percent of Respondents</i>
10b. Based on your observations, has the Building Operator Certification training course led to your [employee / employees] having increased value to your organization in terms of saving money?	Yes	10	83%
	No	2	17%
	Don't know	0	0%

10c. Based on your observations, has the Building Operator Certification training course led to your [employee / employees] having increased value to your organization in terms of helping to improve occupant comfort?	<i>Response</i>	<i>(n=12)</i>	<i>Percent of Respondents</i>
	Yes	8	67%
	No	1	8%
	Don't know	3	25%

10d. Based on your observations, has the Building Operator Certification training course led to your [employee / employees] having increased value to your organization in terms of advising in decisions about equipment operation or replacement?	<i>Response</i>	<i>(n=12)</i>	<i>Percent of Respondents</i>
	Yes	9	75%
	No	2	17%
	Don't know	1	8%

10e. Based on your observations, has the Building Operator Certification training course led to your [employee / employees] having increased value to your organization in terms of having more productive interactions with contractors?	<i>Response</i>	<i>(n=12)</i>	<i>Percent of Respondents</i>
	Yes	10	83%
	No	0	0%
	Don't know	2	17%

10f. Based on your observations, has the Building Operator Certification training course led to your [employee / employees] having increased value to your organization in terms of undertaking, recommending, or influencing any energy-efficiency projects?	<i>Response</i>	<i>(n=11)</i>	<i>Percent of Respondents</i>
	Yes	10	91%
	No	0	0%
	Don't know	1	9%

11. If you were hiring a new employee, how important would the candidates having a building operator certificate be to your hiring decision?	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents</i>
	Very important	1	7%
	Important	12	86%
	Not important	1	7%
	Not at all important	0	0%
	Don't know	0	0%

12. For current employees, how important is having a building operator certificate for promotion and/or advancement?	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents</i>
	Very important	0	0%
	Important	11	79%
	Not important	3	21%
	Not at all important	0	0%
	Don't know	0	0%

13. What do you consider in deciding whether or not to send your employees to the Building Operator Certification Program training course?	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents</i>
	Time/staff availability	9	64%
	Training costs	6	43%
	Location of the training	9	64%
	Instructor/sponsor for the training	1	7%
	Length of training	5	36%
	Your organization's approval process for sending employees to training	3	21%
	Employee professional development	10	71%
	Legal requirements	0	0%
	Gain/benefits for company of certification	8	57%
	The employee's personal interest	6	43%
	Other	0	0%
	Don't know	0	0%

14. How important was the rebate to the decision to send your [employee / employees] to the Building Operator Certification courses?	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents</i>
	Very important	6	43%
	Important	8	57%
	Not important	0	0%
	Not at all important	0	0%
	Don't know	0	0%

15. Would your [employee / employees] have been sent to the Building Operator Certification course if the rebate was not available?	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents</i>
	Definitely would have	0	0%
	Probably would have	4	29%
	Probably would not have	6	43%
	Definitely would not have	3	21%
	Don't know	1	7%

16. Do you think your [employee's/employees'] training in the Building Operator Certification Program training course has increased the likelihood that your organization will participate in energy efficiency programs, such as equipment incentive programs?	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents</i>
	Yes	7	50%
	No	2	14%
	Don't know	5	36%

17. Do you think your (employee's / employees') training in the Building Operator Certification Program training course has increased the likelihood that your organization will make investments in energy efficiency?	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents</i>
	Yes	8	57%
	No	3	21%
	Don't know	3	21%

18. Would you recommend the Building Operator Certificate Program to any of your colleagues in your organization or in other organizations?	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents</i>
	Yes	14	100%
	No	0	0%
	Don't know	0	0%

19. Do you expect your organization to enroll any other staff at your facility in the Building Operator Certificate Program?	<i>Response</i>	<i>(n=14)</i>	<i>Percent of Respondents</i>
	Yes	7	50%
	No	2	14%
	Don't know	5	36%

## Appendix E: Interview Guide for Instructor Survey

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### **Instructor Background**

1. For how long have you been teaching in the BOC program and how many BOC courses have you taught?
  - 1A. Which BOC courses do you teach?
  - 1B. What is your work experience as it relates to the courses you teach?
2. Are you currently teaching any courses outside of the BOC program? Are these courses also related to building operations?
3. Do you do other work aside from teaching in the BOC program?

### **Curriculum and Instructional Material**

4. What do you think of the BOC curriculum?
  - 4A. Does it cover the right topics or are there some that aren't taught that should be?
  - 4B. Do you think any of the course topics are unnecessary?
5. Are you provided with instructional materials (e.g., slides, workbooks)?
  - 5A. What is your assessment of the materials? Do they do a good job of conveying the concepts presented in the course?
  - 5B. Do you supplement this material, if so, with what?
  - 5C. Are there any topics related to energy efficiency that are not addressed that you think should be?

### **Instructional Environment**

6. How would you assess the facility where the courses are taught?
  - 6A. Is it a good environment for teaching?
  - 6B. Are the rooms large enough and do they have adequate seating?
  - 6C. Are the appropriate teaching materials available in the classrooms (e.g., white boards, PowerPoint)?
7. Do you think that the students you teach have enough prior understanding and experience to benefit from the course?

7A. Have you taught students who are not sufficiently challenged by the course?

7B. Are the students generally motivated to learn? If no, are there changes that could be made to the course content or structure that would more effectively motivate students?

### **Program Administration**

8. How well is the program administered?

8A. Do you receive sufficient support from the administrators?

8B. Is there any aspect of the Building Operator Certification program or with your experience as an instructor that you are not satisfied with?

### **Conclusions**

9. Do you have any suggestions how the course could be improved in terms of content or delivery?